Niveau(x) d'enseignement : 7 Numéro EDUQ : 9270214
Centre d'intérêt : 770

Kerwin-Boudreau, Susan.

The development and assessment of the Success-in-College Project / Susan Kerwin-Boudreau, Dianne Bateman. -- Saint-Lambert : Collège régional Champlain, [1991?].
vi, 63 f. ; 28 cm.

Résumé : p. iv. Code : 1532-0329. Bibliogr. : f. 40-45. "Cette recherche a été subventionnée par la Direction générale de l'enseignement collégial dans le cadre du Programme d'aide à la recherche sur l'enseignement et l'apprentissage".

ISBN 2-9801273-5-3

Vedette(s)-secondaire(s) : Bateman, Dianne • Collège régional Champlain

Descripteur(s) : Aide à l'apprentissage • Programme d'études • Evaluation de programmes • Sciences sociales • Habileté d'apprentissage • Succès scolaire • Difficulté de lecture • Sens critique • Image de soi • Collégial (Ordre d'enseignement)

Identificateur(s) de sujet : Success-in-College Project

Cette étude a cherché à évaluer comment le manque de préparation aux études collégiales conduit à l'échec scolaire. Elle a voulu plus précisément évaluer l'efficacité d'un programme interdisciplinaire mis sur pied au collège régional Champlain en 1989, le Success-in-College Project, en vue de développer les habiletés d'apprentissage nécessaires à la réussite au collège. Ce programme a été expérimenté auprès d'étudiants en sciences sociales. Les résultats de l'expérimentation montrent une amélioration des stratégies d'apprentissage supérieure pour le groupe expérimental mais aucun des deux groupes n'a fait preuve de progrès significatif en ce qui a trait au rendement scolaire et à l'estime de soi. Les compétences en lecture et les capacités "d'apprendre à apprendre" se sont améliorées également pour les deux groupes. Pour évaluer si une meilleure compréhension des stratégies d'apprentissage peut favoriser le développement d'habitudes durables porteuses de succès scolaire, il faudra effectuer des recherches supplémentaires.

Type de document :

9270214

THE DEVELOPMENT AND ASSESSMENT OF THE SUCCESS-IN-COLLEGE PROJECT

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On peut obtenir des exemplaires supplémentaires de ce rapport de recherche en s'adressant au

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ACKNOWLEDGEMENTS

A project of this magnitude could not have been carried out without the help of many. The teachers, including Catherine Gillbert, Yvon Geoffroy, Ellie Malus, Aileen Ouvrard, and Stuart Robertson, persisted in the belief that it was important to offer students a second chance. Catherine Plaw, our conselor, worked patiently with each group of students. Dianne Bateman, our pedagogical consultant, visited the students at strategic times throughout the semester and solicited valuable feedback for us. She also played a major role in producing this final report. Throughout this entire project, the St. Lambert college administration was very supportive. Special thanks is owed to our Registrar, David Schurman, who was always most cooperative. To all of you, my deepest thanks.

Susan Kerwin-Boudreau

Susan Kerwin-Boudreau

ABSTRACT

The purpose of the present study was to examine how academic underpreparedness contributes to student failure, and to assess the effectiveness of an interdisciplinary program designed to foster the intellectual abilities and learning skills needed to succeed in college. Failing social science students ($n=56$) were given a special 15 week program which attempted to simultaneously teach course content and the academic skills required for college success. A quasi-experimental nonrandomized control-group pretest-posttest design was used (Isaac & Michael, 1981). It was hypothesized that the students who received the treatment, when compared to a control group that did not, would show (a) significant improvement on posttest measures of reading skills, critical thinking skills, learning strategies and attitudes towards learning, (b) a higher overall average during the semester that they were registered in the project, (c) fewer course withdrawals and course failures, (d) a stronger academic persistence profile, that is, a higher probability of returning the following semester and registering for a full course load, and (e) increased self-esteem. This research was motivated by the belief that the intellectual skills and learning strategies needed for success in college could be taught through course content, and that the transfer of these skills would be facilitated when content teachers work collaboratively. Results show that both the experimental and the control groups improved their reading and increased their awareness of how to learn during the 15 week semester. The improvement in knowledge of learning strategies was significantly higher for the experimental group. Despite the improvement in these two areas, neither group showed significant gains in general academic achievement nor in self-esteem. To determine if increased awareness of how to learn translates into permanent habits that affect academic achievement, further study of the students who participated in the S.I.C.P. research is suggested.

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INTRODUCTION

One of the greatest challenges facing college educators today is the need to accept and to educate a highly diversified student population who in many cases are unprepared academically for college level work. High attrition rates among these students have led to the necessity of implementing special programs where their specific needs to develop academically and intellectually are addressed.

The lack of adequate skills required to succeed in college is a strong threat to retention, and dropout has become a major concern in the U.S. and Canada. According to Noel & Levitz (1983), the rate of attrition among college freshmen in the United States is about one third, and these dropout rates have remained fairly constant since the mid 1970s. Moreover, Hoehn and Sayer (1989) report that only about 25% of American students who begin college actually receive a degree.

Dropout has become an increasingly serious problem within the Quebec collegial network. Noël (1988) reported that although 47% of the Quebec population between the ages of 17 and 19 attend Cegep, only 65% of these students finish their programs and receive their diplomas. A comparison of cohort samples from 1976-1982 (Ducharme, 1989) indicated that the rate of Cegep students receiving their diploma is slightly under 60%.

These high student attrition rates have been cause for much concern, and in the United States, several national reports including *A Nation at Risk* (1984) produced by the National Commission on Excellence in Education, and *Involvement in Learning* (1984) produced by the National Institute of Education have called for a reform of undergraduate education. In 1987, The Carnegie Foundation for the Advancement of Teaching issued a report produced by president Ernest Boyer entitled *College: The Undergraduate Experience in America*. This study urged institutions to abandon the "sink or swim" approach for freshmen and to initiate active efforts to help them succeed (Upcraft & Gardner, 1989).

In Quebec, the 1988 report of the Conseil des Collèges listed as two of its three major

orientations: (1) to increase the chances of success for all college students, and (2) to renew and develop assistance to students experiencing academic difficulty. In its 1989 report entitled *Une Meilleure Articulation du Secondaire et du Collégial*, the Quebec Superior Council of Education listed as one of its major recommendations:..."il importe que le cégep offre des cours d'appoint et des mesures de rattrapage suffisantes et adéquates" (p. 86).

In order for remedial programs to be effective, they must address the causes of student failure. Noël (1985) reports that students drop out of college for any number of complex reasons. Among these are: (1) academic boredom or repetition of work already covered in high school, (2) irrelevancy or an inability to see how college work will be useful beyond the classroom, (3) unrealistic expectations of what college is all about, (4) difficulties in adjusting to the transition from high school to college, (5) lack of goals, including lack of career goals, and the resulting uncertainty concerning one's area of specialization, (6) a possible incompatability or a mismatch between the student and the institution, and (7) academic underpreparedness, including the inability to listen, speak, read, write, and to think critically.

Purpose of the Study

Although the causes of student attrition are many and their interrelationships complex, the present study will focus on how academic underpreparedness contributes to student failure and dropout. Boyer (1987) has shown that fifty percent of the entering American college population do not possess complex intellectual abilities. The basic premise of this study is that this lack of academic preparation, especially in the areas of reading, thinking, and the use of learning strategies, seriously cripples one's chances for academic success. Specifically, this research maintains that when selected Social Science review board students, that is, students who have failed or abandoned half or more of their courses within one semester, (Regulation 33 of the Régime Pédagogique) are provided with a one-semester special curriculum that emphasizes the acquisition of background knowledge and the use of reading, thinking, and learning strategies, their chances of remaining in college will increase.

THEORETICAL FRAMEWORK

Although CEGEP students arrive at college with a certain amount of background knowledge, many content areas are being studied for the first time. In addition, the problem solving strategies transferred from high school may not be appropriate for college learning tasks (Bateman, 1990; Weinstein & Mayer, 1986). Despite these constraints, college students are faced with academic tasks that require both extensive background knowledge and proper strategies for organizing that knowledge into a readily learnable mode. Students are expected to read critically, write clearly, think logically and use learning strategies appropriately. The lack of adequate academic preparation for college has been documented in the research, particularly in the areas of reading, thinking, and the use of learning strategies (Noël, Levitz, & Saluri, 1985; Roueche, Baker, & Roueche, 1984; Weinstein, Goetz, & Alexander, 1988).

Reading

Reading scores have been declining steadily (Hunter and Harmon, 1979; National Commission on Excellence in Education, 1984). Today's average high school graduate completes high school with better than a B average and yet reads below the grade 8 level (Roueche, Baker & Roueche, 1984). But before one can begin to suggest strategies for remediating reading skills, the process involved in reading comprehension must be examined.

Comprehension has been the focus of research in reading. The aim of this research has been to understand the internal processes involved in reading, that is, what the reader does while reading. The view of comprehension as a process of getting meaning from a text has been revised so that comprehension is now considered to be an interactive process, a process of bringing meaning to a text (Kintsch & van Dijk, 1978; LaBerge & Samuels, 1974; Ruddell & Speaker, 1985; Rumelhart, 1985; Samuels, 1985). Basically, the theory of reading as an interactive process proposes that reading is influenced by processing speed, prior knowledge of the subject matter and metacognitive processes and strategies.

The speed at which a reader processes information affects comprehension. The reader can

direct attention to one of many elements while viewing a word, but he or she cannot attend to all of them. For example, during the initial stages of learning to read, the reader may have to devote all attentional resources to decoding. As skill in decoding progresses and becomes more automatic, attentional resources can be directed toward the more complex aspects of reading such as understanding word meanings, selecting relevant information, noting relationships, recognizing assumptions, drawing conclusions, and judging the validity of arguments (Herber, 1978). College reading tasks require that both the basic and complex skills of reading be at an automatic level.

Reading ability is also influenced by the reader's amount of background knowledge of the subject matter. The main goal of the reader is to construct a model of the text being read. If the reader knows a great deal about the subject being studied, comprehension is facilitated; if background knowledge is lacking, comprehension becomes more difficult (Anderson, Spiro & Anderson, 1978).

College reading tasks require two types of reading: reading for meaning (comprehension) and reading for remembering (studying). Both types of reading are influenced by the student's metacognitive status, that is, both the degree and awareness students have over their learning activities (Baker & Brown, 1984). According to Brown (1980), some of the metacognitive skills involved in reading are: (a) clarifying the purposes of reading, that is, understanding the explicit and implicit task demands; (b) identifying the important aspects of a message; (c) focusing attention on major content, rather than on trivia; (d) monitoring ongoing activities to determine whether comprehension is occurring; (e) engaging in self-questioning to determine whether goals are being achieved; and (f) taking corrective action where comprehension fails. In order to use these strategies, college students must possess a good deal of knowledge about themselves as learners, knowledge of the task and what is required, and knowledge of the text and how to use it (Bateman, 1990). Clearly, the reader's capability to think about and to control what is comprehended and learned is crucial to achievement (Jones, 1988).

The process of reading for meaning and for remembering can be further broken down into three levels of comprehension: literal comprehension, inferential comprehension, and analytical

comprehension (Herber, 1978). Literal comprehension requires that the reader identify and describe the information that is contained in the text. Inferential comprehension requires that the reader make reasonable inferences which go beyond the actual information contained in the text. Analytical comprehension requires that the reader break down the material into its component parts so that its organizational structure may be understood. This may include the identification of parts, analysis of the relationship between parts, and recognition of the organizational principles involved (see Appendix A for a complete description of the three levels involved in the criteria for effective reading). Research by Meyer (1980) has shown that experienced readers are able to infer an author's textual schemas with explicit cues, whereas inexperienced readers cannot.

The ability to reflect on one's own cognitive processes, that is, to be aware of one's own activities while reading, is a late-developing skill and demands a sophisticated reader and learner (Baker & Brown, 1984). Research on metacognition makes it clear that cognitive skills for comprehending and studying a text can be taught (Brown, 1980; Brown & Day, 1983; Palinscar & Brown, 1984) and may have a powerful impact on reading comprehension (Armbruster & Brown, 1984; Paris, Cross, & Lipson, 1984). For example, Weinstein and Underwood (1985) have shown that when students are taught to use specific reading strategies, their scores on a standardized reading test increase significantly. Golinkoff (1976) and Ryan (1980) have noted that active information processing strategies play an important role in successful reading comprehension, with good readers differing from poor ones in their use of strategies for transforming the information contained in texts so that it becomes easier to understand and remember. It is precisely these processes of self-regulation that college students need to acquire in order to read college level texts effectively.

Critical Thinking

It is widely accepted that critical thinking skills are essential for learning and success in college (Compton, 1989). College is seen as a time when students can change, record, or reconstruct their thinking processes (Meyers, 1986). However, research has shown that college

students often lack both background knowledge and thinking skills, and specifically have difficulty with logical analysis, synthesis, and critical judgement (Bateman, 1990; Boyer, 1987; Torkia-Lagacé, 1981).

Critical thinking has been discussed in terms of the ability to reason logically (Brookfield, 1987; Hallet, 1984; Perkins, 1985; Ruggiero, 1975); the ability to independently find and question assumptions (Baron, 1981, 1985; Scriven, 1976); and the ability to think abstractly, to analyse and to evaluate (Donald, 1985). Dressel and Mayhew (1954) delineated five critical thinking skills: defining the problem, selecting pertinent information for the solution of the problem, recognizing stated and unstated assumptions, formulating and selecting relevant and promising hypotheses, and drawing conclusions and judging valid inferences. Cromwell (1986) describes a four step process that students go through in learning to think critically: observing, inferring, relating, and integrating.

Several investigators have recommended that critical thinking be incorporated into specific course content. They believe that this will facilitate the acquisition of knowledge and produce students who can think critically and reflectively about a subject (Bransford, Sherwood, Vye & Rieser, 1986; Glaser, 1984; Sternberg, 1985). Cromwell (1986) described how the faculty at Alverno College teach thinking within the context of existing classes. Halonen and Cromwell (1986) have reported on the successful teaching of critical thinking in psychology by educators in the United States. Learning to think clearly and critically about issues both inside and outside of the classroom is important for success in college. The college classroom is a good place to refine this process.

Learning Strategies

Critical thinking and reading are activated during the learning process through the use of learning strategies. According to Weinstein (1988), poor students lack metacognition, that is, they are deficient in their use of active learning strategies, and they lack a knowledge of themselves as learners. Specifically, these students lack (a) metacognitive awareness (i.e. an awareness of

themselves as learners), (b) metacognitive knowledge (i.e. a knowledge of specific learning strategies), and (c) executive control (i.e. the ability to plan, implement, monitor, evaluate, and, if necessary, to modify a cognitive course of action). Poor students seem to view learning as a set of facts and answers that are "out there", apart from themselves and their interaction with the subject matter. Good students, on the other hand, exhibit metacognition in that they plan their learning, monitor it in progress, and assess their own skills during the learning process.

Although one might expect that college students, graduates of several years of formal schooling, would be adept at the use of metacognitive strategies, the opposite is often true. Schallert and Kleinman (1979) claim that this is due to the fact that teachers at both the elementary and high school levels typically perform this function for their students. While this may perhaps serve as an effective teaching strategy, it does not function as an effective learning strategy, as many college students continue to rely on their teachers to organize their learning. College is seen as the time when students are expected to move from the teacher-directed learning environment of high school to a more student-directed learning environment wherein the teacher becomes one of the many available resources that can be utilized. Metacognitive skills can serve as a basis for the development of autonomy in our students.

Several attributes of both the learner and of the learning task can affect strategy use. The learner's perceptions concerning the attributes of the strategy can influence whether or not it is used (Pressley, Borkowski, & O'Sullivan, 1982). For example, if a strategy is perceived as requiring too much of an effort, the learner may decide not to use it. Students' perceptions of their own achievement attributes may affect strategy use (Weiner, 1976; 1979). For example, if a student perceives himself as incompetent, he may not attempt to use a strategy. Palmer and Goetz (1988) report that students who have low performance expectations, who are anxious and self-critical about their performance, who do not initiate study efforts or who do not persist at studying are less likely to use effective strategies. Thus, the match that the learner perceives between his own particular attributes and the attributes of the strategy may affect strategy use (Palmer and Goetz, 1988). In addition, the perceived efficacy of the learning strategy for obtaining a desired learning

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outcome may affect strategy use (Kennedy & Miller, 1976). Finally, students with more schooling report the using more and varied strategies (Weinstein, Wicker, Cubberly, Rahey, & Underwood, 1980) . Thus, training in the use of metacognitive strategies should assess the match between the learner's perceived abilities, the amount of effort involved, and the attributes of the strategy.

The failure to use learning strategies effectively, translates into the problem of failing to transfer and to apply these newly learned skills to other disciplines (Cross, 1976; Roueche & Snow, 1977). However, several factors can encourage the transfer of learning skills across the curriculum. Research indicates that the most effective learning skills programs use relevant content as the skills are taught (Gruenberg, 1983) and enlist the students' active involvement in knowing why, when, where and how the skills can be useful (Denton, Seybert, & Franklin, 1988, p.20). Chipman (1985) emphasizes the generalization of the skills to other subject areas as a crucial factor in successful learning skills programs.

Weinstein (1988) views metacognition or getting students to take responsibility for their own learning, as the most significant component of strategy use and transfer. Weinstein (1987) suggests that all teachers can do a great deal to encourage the transfer of learning strategies across the curriculum. She suggests implementing a metacurriculum, that is, teaching learning strategies while teaching one's own content area. This will not only allow a student to master content-specific material in a course, but will also enhance the student's ability to become an independent and effective learner. Thus, the use of relevant content, the active involvement of the student, the emphasis on generalization of the strategies, and an awareness of oneself as a learner, that is, metacognition, appear to influence the use and the transfer across the curriculum of learning strategies.

Good teaching means delivering content, and simultaneously teaching students how to learn, how to think, how to remember and how to motivate themselves. Some teachers resist the idea of incorporating the teaching of learning strategies into regular course content for fear that too much class time will be directed away from content area knowledge. However, it seems that students learn more effectively when they have been instructed in the process of learning (Norman,

1980; Weinstein, 1981; 1987).

Weinstein and Mayer (1986) provide substantial evidence for the hypothesis that learning strategies can be described and taught to learners who are at appropriate levels of maturity, from the preschool years to adulthood. For example, Weinstein (1982) reports substantial gains in reading comprehension, academic performance and stress reduction for college students participating in an experimental undergraduate learning strategies course. Several other researchers including also support the view that instructing students in the use of learning strategies will influence the way in which they process new information and acquire new skills (Dansereau, 1985; Jones, Ameran, & Katims, 1984)

McCombs (1982a, 1982b) has developed self-instructional learning strategies materials in the areas of time management, study skills and self-motivation. Implementation of these materials with military technical training students led to improved test scores and lower test failure rates. Students also reported an increase in motivation and in their ability to assume more responsibility for their learning. Thus, it appears that learning strategies can be taught and that teaching these strategies can influence student learning.

Self-Esteem

Studies on college students have shown self-esteem to be important when explaining achievement, especially academic achievement (Baily, 1971; Kubiniec, 1970; Reynolds, 1982; Smart & Pascarella, 1986). Coopersmith (1981) describes the term "self-esteem" as the evaluation a person makes and customarily maintains with regard to him or herself. Self-esteem expresses an attitude of approval or disapproval and indicates the degree to which a person believes him or herself capable, significant, successful and worthy. In short, self-esteem provides a mental set that prepares the person to respond according to expectations of success, acceptance, and personal strength.

The self-concept or one's perception of oneself has been shown to be positively related to academic achievement (Brookover, 1969; Caplin, 1969; Coopersmith, 1967, 1981b). For

example, Wassenberr and Clifford (1964) suggest that the kindergarten child's feelings about him or herself are a better indication of reading readiness than are his or her scores on an intelligence test. Similarly, studies on college students have shown self-concept to be important when explaining achievement, especially academic achievement (Bailey,1971; Kubiniec, 1970; Reynolds, 1982; Smart & Pascarella, 1986). Palmer and Goetz (1988) have shown that students with a low self-concept, that is, those who have low expectations for future performance, are anxious and self-critical. They do not initiate studying or fail to persist in studying and are less likely to use effective learning strategies.

A positive relationship among the use of study skills, self-concept, and academic achievement has been reported for students at the university level (Gadzella &Williamson, 1984). Zarb (1981) reported that academic self-concept and study habits were significant predictors of GPA for both male and female students. Thus, it seems that efforts at remediation should address five factors that influence academic success: (1) reading skills, (2) thinking skills, (3) learning strategies, (4) transferring of skills across the disciplines, and (5) self-concept.

Student Development Programs in Quebec

A number of remedial programs have been developed in Quebec, including those at Cegep St-Jean-sur-Richelieu (Brodeur, 1989) and at Cegep de Rimouski (Briand, 1987). At Cegep St-Jean-sur-Richelieu, students with a weak high school profile were obliged to register in a "programme d'acceuil" of three core courses. Brodeur (1989) reported that many students felt that this remedial program had been thrust upon them. Participating teachers reported motivational and discipline problems arising in the classroom. Although a comparison of experimental and control groups yielded significant results, the considerable investment in terms of both human and financial resources was judged not to be worthwhile. It was speculated that the lack of voluntary registration played a role in preventing this program from succeeding.

At Cegep de Rimouski, weak students were strongly encouraged to enroll in a number of core courses. However, weak students do not always accept the fact that adjusting to college may

require assistance. Researchers at Rimouski reported that students seem to assume that their acceptance into Cegep is proof that they will be able to handle college-level work.

The Success-In-College Project

Pilot Phase

At Champlain Regional College, St. Lambert, five teachers began meeting weekly during the Fall 1989 semester to discuss the possibility of creating a support program for returning Social Science review board students (i.e., students who have failed or abandoned half or more of their courses during the previous semester). A special curriculum of five courses including English, Psychology, Political Science, Humanities, and Physical Education was developed. The students remained together as an intact group for these five courses, which were designed to provide students with the background knowledge and learning strategies that would allow them to experience success in college. In addition, a weekly group meeting with a counselor was included to promote group cohesiveness and to provide students with information on goal setting and career choices.

During the Winter 1990 semester, the pilot phase of the Success-In-College Project (S.I.C.P.) project began. Students were interviewed and those who expressed a desire to be part of the project were accepted. Twenty-seven students were admitted during the Winter 1990 semester.

Experimental Phase

The experimental phase of the S.I.C.P. was launched during the 1990-1991 academic year. The researchers were concerned with four main issues: (1) selection, (2) curriculum, (3) social integration, and (4) transfer of skills. As in the pilot phase, only those Social Science review board students who applied for admission to the project were accepted. The original curriculum of five courses was expanded to include a sixth course, Sociology. Students could opt to register for a seventh course of their choice, outside of the project. As in the pilot phase, these courses were designed to provide students with the background knowledge, basic skills, and learning strategies

that would increase their chances for academic success. To create a sense of group cohesion and to foster the integration of content knowledge and learning skills across the curriculum, students, as in the pilot phase, remained together as an intact group for their six courses.

Objectives of the S.I.C.P.

In June of 1990, three faculty members of the S.I.C.P. attended a week-long workshop at Alverno College in Milwaukee on the topics of *Assessment* and *Teaching Abilities Across the Curriculum*. Following the workshops, the team recognized the need to articulate and to work towards general project objectives that could then be translated into specific teaching strategies within the classroom. This process began with each teacher asking themselves the question, "What kind of student do I want to see at the end of this project?" Four project objectives were articulated:

(1) To help students communicate more effectively. This includes reading, writing, listening, and oral communication skills;

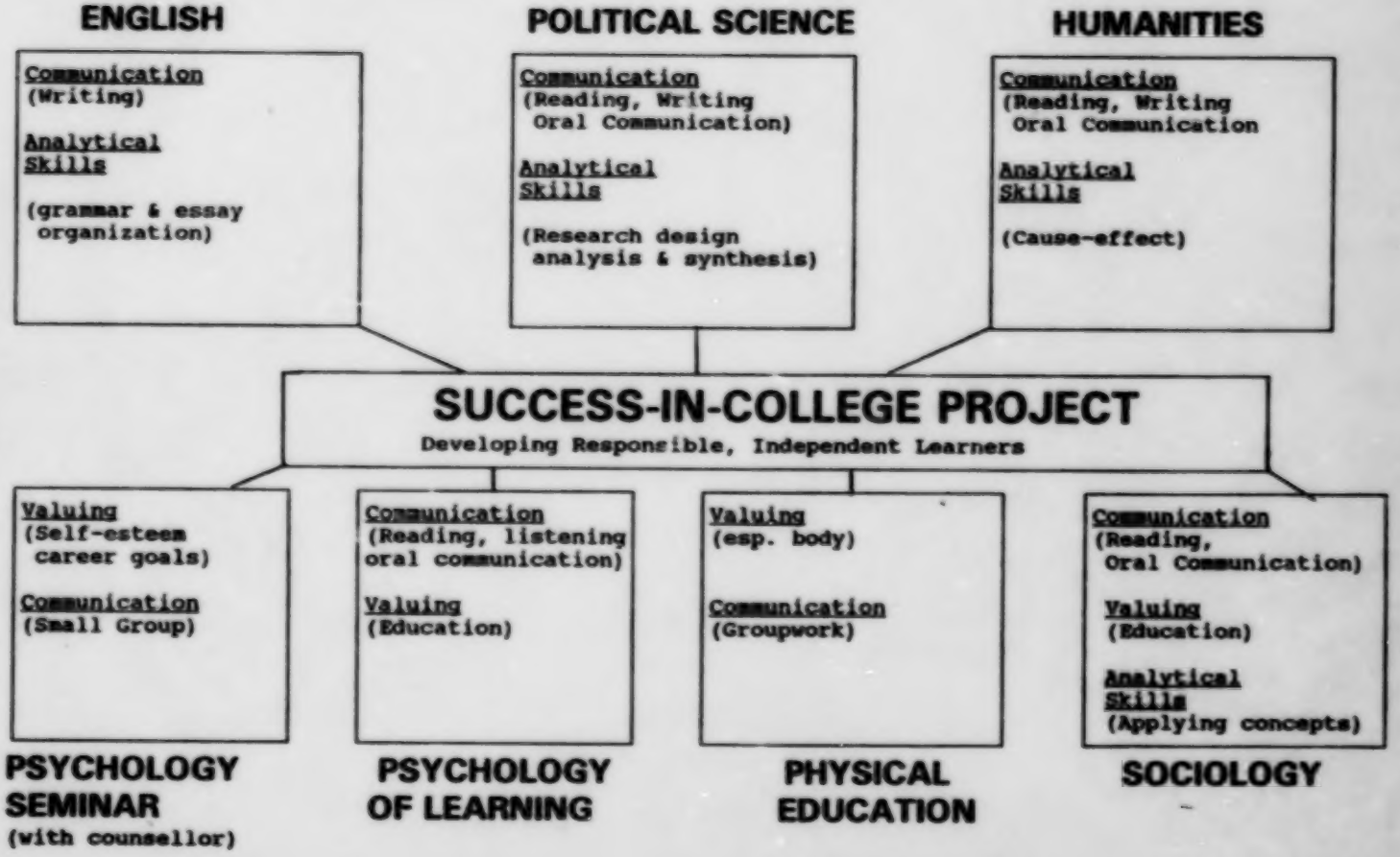
(2) To help students become more responsible, independent learners;

(3) To encourage students to value a total education: mind, body, and spirit.

(4) To encourage the development of analytical thinking.

Teachers in the individual courses worked to varying degrees to develop the skills associated with the four abilities outlined in the four general objectives. The process is outlined in Table 1. Table 1 is further elaborated on in Appendix B.

TABLE 1 **STRUCTURE OF THE S.I.C.P. AND COURSE-RELATED ABILITIES**



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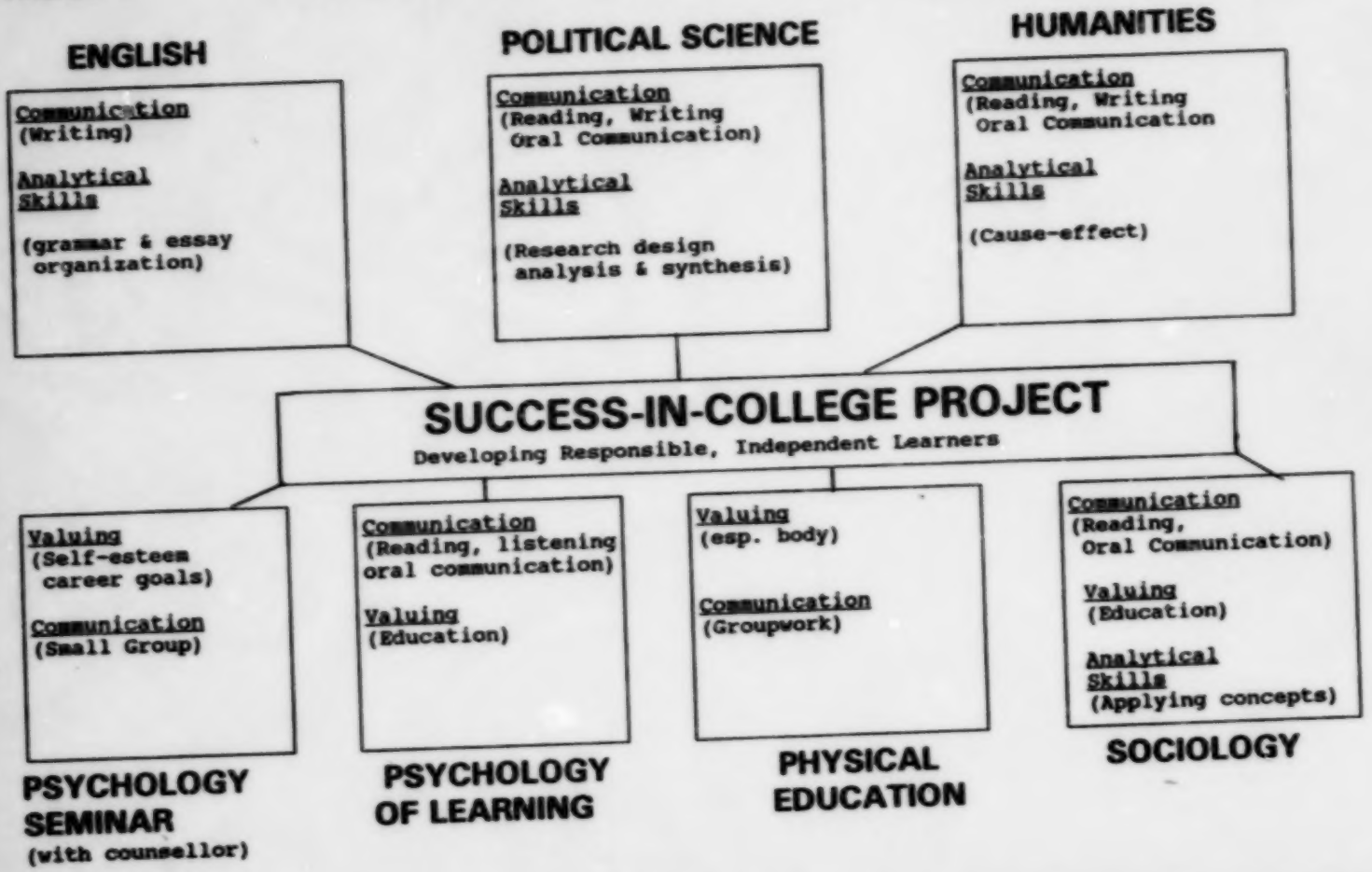


Hypotheses

The main hypothesis of this study was that selected Social Science review board students could acquire the intellectual skills and learning strategies necessary for academic success if they are provided with a special curriculum. Specifically, students enrolled in the S.I.C.P. during the Fall 1990 and Winter 1991 semesters, when compared to control group subjects, will have (a) a significant improvement on post-test measures of reading skills, critical thinking skills, learning strategies and attitudes towards learning, (b) a higher overall average during the semester that they are registered in the project, (c) fewer course withdrawals and course failures, (d) a stronger academic persistence profile, that is, a higher probability of returning the following semester and registering for a full course load, and (e) increased self-esteem.

This research is based on the premise that these intellectual skills and learning strategies can be taught simultaneously through course content, and that the transfer of these skills will be facilitated when content teachers work collaboratively.

METHOD

Research Design

The study was carried out using a quasi-experimental nonrandomized control-group pretest-posttest design (Isaac & Michael, 1981). The dependent variables included measures of reading, critical thinking, study habits and attitudes, learning strategies, self-esteem, and academic achievement. The independent variable was treatment group (experimental or control). A quasi-experimental design was used because the research was carried out in an educational setting which typically involves fixed conditions (Cook & Campbell, 1979).

Subjects

The experimental group included one group of Social Science review board students in the Fall 1990 semester (n=26) and one group in the Winter 1991 semester (n=30). All of these students were interviewed by at least two members of the team and expressed a desire to join the project. The combined experimental group consisted of 29 female and 27 male subjects ranging in age from 17 to 20 (see Table 2). At the time of the beginning of the project, most students were 17 years old (36%) or 18 years old (36%). The overall mean age was 18.32.

Table 2 - Ages of Students in Experimental Group

AGE	FREQUENCY	PERCENT
17	20	36
18	24	43
19	10	18
20	2	3
Total	56	100.0

The control group included one group of Social Science review board students in the Fall 1990 semester (n=15) and one group in the Winter semester (n=24). The combined control groups consisted of 13 female and 26 male subjects ranging in age from 17 to 21 (see Table 3). The overall mean age was 18.63. The lower number of control group subjects was due to the limited

number of review board students who were readmitted with a full course load.

Table 3 - Ages of Students in Control Group

AGE	FREQUENCY	PERCENT
17	11	28
18	13	33
19	12	31
20	2	5
21	1	3
Total	39	100.0

Measures

Selected instruments (Table 4) were used to measure development in reading, critical thinking, learning strategies, attitudes toward learning, and self-esteem. Academic achievement was also measured.

Table 4 - Measures Used in the Study

Competency	Measure
Reading	Nelson-Denny Reading Test (NDRT) (Forms E.&F)
Critical Thinking	Watson-Glaser Critical Thinking Appraisal (Forms A & B)
Attitude Toward Learning	Survey of Study Habits and Attitudes (SSHA) Student Interviews
Learning Strategies	Learning and Study Strategies Inventory (LASSI) and (SSHA)
Self-Esteem	Coopersmith Inventory
Academic Achievement	Term Averages Persistence in College

Reading

The Nelson-Denny Reading Test was used to measure reading ability. This test was chosen for three reasons: (a) the theoretical base on which it was constructed closely matches the definition of reading presented in the literature, (b) it was restandardized in 1981, and (c) it provides norms for the two-year college population. The Nelson-Denny Reading Test measures both vocabulary development and comprehension. The Vocabulary section consists of 100 items, each with five answer choices, and has a time limit of 15 minutes. The 36 items in the comprehension section are divided equally between literal and interpretative questions. The literal items require that the reader grasp specific details and facts, whereas the interpretative items require that the reader note relationships, draw conclusions, make generalizations and deductions, determine the writer's purpose, and identify the main idea. The NDRT was computer scored. Two forms of the test were used to control for testing effects: Form E was used for the first observations (August 1990, and January 1991), and Form F was used for the second observations (December 1990 and May 1991).

The reliability of the Nelson-Denny Reading Test was established through an alternate-form reliability study. The median alternate-form reliability coefficient for the Vocabulary score was .92, the median across-grades, alternate-form reliability coefficient for the Comprehension score was .77. Further information regarding the reliability of the Nelson-Denny Reading Test can be found on page 16 of the Examiner's Manual.

Critical Thinking

The Watson-Glaser Critical Thinking Appraisal (Watson & Glaser, 1980) was used to measure several components of critical thinking. This test provides a total score and separate subtest scores for each of five subtests: Inference, Recognition of Assumptions, Deduction, Interpretation and Evaluation of Arguments. The score for each subtest is 16 points, for a total possible score of 80. The Inference subtest determines whether the subject can discriminate among degrees of truth or falsity of inferences drawn from given data. Recognition of Assumptions

requires that the subject recognize stated assumptions or presuppositions in given statements or assertions. Deduction requires that the subject determine whether certain conclusions necessarily follow from information in given statements or premises. Interpretation demands the weighing of evidence and deciding if generalizations or conclusions based on the given date are warranted. Evaluation of Arguments requires that the subject distinguish between arguments that are strong and those that are weak or irrelevant to a particular question. Two forms of the test were used to control for testing effects: Form A was used for the first observations (August 1990 and January 1991), and Form B for the second observations (December 1990 and May 1991).

The reliability of the Watson-Glaser Critical Thinking Appraisal was assessed through estimates of internal consistency, the stability of test scores over time, and the correlation between scores on alternate forms. Internal consistency was measured by calculating split-half reliability coefficients which ranged from .69 to .85. The correlation of responses at two time periods was .73, while the correlation of responses to Form A and Form B was .75. Further information regarding the reliability of the Watson-Glaser Critical Thinking Appraisal can be found on page 10 of the Examiner's Manual.

Learning Strategies and Attitudes Toward Learning

Two measures were used: the Learning and Study Strategies Inventory (Weinstein, Palmer, & Schulte, 1987) and the Survey of Study Habits and Attitudes (Brown and Holtzman, 1965). The Learning and Study Strategies Inventory (LASSI) is an assessment tool designed to measure students' use of learning and study strategies and methods. It is both a diagnostic and prescriptive measure that assesses the student's thought processes and behaviors. The LASSI was chosen because it is frequently used to assess student use of learning strategies at the college level.

There are 77 items on the LASSI. For each item, the student is asked to darken the letter that corresponds to how well the statement describes them from *not at all typical* to *very much typical* of the student. These responses are then scored on the following ten scales: Attitude, Motivation, Time Management, Anxiety, Concentration, Information Processing, Selecting Main

Ideas, Study Aids, Self Testing, and Test Strategies. Each scale, with the exception of the selecting Main Ideas Scale, has 8 items. Selecting Main Ideas has 5 items. Coefficient Alphas for the scales range from a low of .68 to a high of .86 and test-retest correlation coefficients from the scales range from a low of .72 to a high of .85, demonstrating a high degree of stability for the scale scores.

The LASSI yields ten individual scale scores, one for each of the ten scales. These scale scores can then be compared both numerically and graphically to percentile score equivalents provided with the LASSI. The percentile score equivalents are based on national norms developed using incoming freshman classes (beginning of grade 13) in the United States. The LASSI takes approximately 15-20 minutes to complete. It uses a self-report format and does not require any special administrative procedures. It also has a simple scoring scheme that can be used by students to compute their own scale scores right on the instrument. For further information the User's Manual for those administering the LASSI may be consulted.

The Survey of Study Habits and Attitudes (SSHA) furnishes students with information on both their study habits and their attitudes towards school and the learning process. This inventory consists of 100 statements. Students are asked to read each item and to decide whether the item applies to them *rarely* (0-15% of the time), *sometimes* (16-35% of the time), *frequently* (36-65% of the time), *generally* (66-85% of the time), or *almost always* (86-100% of the time). Answers are marked on a corresponding answer sheet. After the test is corrected, each student's responses are scored on the following four basic scales:

1. Delay Avoidance (DA). This scale measures promptness in completing academic assignments, lack of procrastination, and freedom from wasteful delay and distraction.

2. Work Methods (WM). This scale measures the use of effective study procedures, efficiency in doing academic assignments, and how-to-study skills.

3. Teacher Approval (TA). This scale measures student opinions of teachers and their

classroom behavior and methods.

4. Education Acceptance (EA). This scale measures student approval of educational objectives, practices and requirements.

In addition to the measures listed above, students were also given two subtotals, one of study habits (SH) ((DA +WM = SH)) and one of study attitudes (SA) ((TA + EA = SA)). A total score (SO) measuring both study habits and study attitudes is also provided (SH + SA = SO). The raw score for each of the seven scales (DA, WM, TA, EA, SH, and SO) is translated into a percentile rank which can be plotted on an accompanying graph located at the back of each answer sheet. Thus, each student is provided with their personal profile of study habits and attitudes. Individual strengths and weaknesses can be identified by examining the deviation from the 50th percentile (the average score) on each of the seven scales. Both high school and college freshmen norms are available for the SSHA. Form C (college norms) was used in this research.

According to Brown and Holtzman (1966), the four basic scales of the SSHA (DA, WM, TA and EA) measure behaviors and attitudes that play an important role in academic achievement. High scores on the SSHA are characteristic of students who obtain good grades, whereas low scores are characteristic of students with poor grades. In addition, both the validity and the test-retest reliability of the SSHA have been firmly established (see Examiner's Manual for further details).

Self-Esteem

The Coopersmith Inventory (Adult Form) is designed to measure self-esteem or one's evaluative attitudes towards the self in social, academic, family, and personal areas of life. There are three forms of the Coopersmith Self-Esteem Inventory (SEI), including the School Form (consisting of 58 items and used with students aged eight through fifteen), the School Short Form (consisting of 25 items and used with the same age group) and the Adult Form (consisting of 25 items and used with persons aged 16 and above). The Adult Form was used in this research.

On the Adult Form, the student determines whether each item is *like me* or *unlike me*. The inventory takes a maximum of ten minutes to complete and it can be scored in a few minutes using the accompanying scoring keys (negative items are scored correctly if answered *unlike me* and positive items are scored correctly if answered *like me*). To arrive at a Total Self Score, all items answered correctly are totalled. The total raw score is then multiplied by four, resulting in a maximum possible Total Self Score of 100.

Most of the research on the Coopersmith SEI has been carried out using the School Form. However, test-retest reliability estimates for college students using the Adult Form yielded coefficients of .80 for males and .82 for females (Bedeian, Geagud, & Zmud, 1977). Several studies using the School Form have confirmed the construct validity of the inventory. The correlation between the School Form and the Adult Form exceeds .80 (Coopersmith, 1981b). Coopersmith (1967) has also shown that SEI scores are significantly related to academic achievement. In addition, norms are available for the Adult Form. The Examiner's Manual is available for more information.

Academic Achievement

Academic achievement was determined by the following criteria:

1. Percentage of courses passed, failed, and abandoned in the term preceding the S.I.C.P. Project;
2. Percentage of courses passed, failed, and abandoned during the S.I.C.P. term;
3. Semester average for preceding term;
4. Semester average for S.I.C.P. term;
5. Percentage of students permitted to return to college;
6. Percentage of students registered in college in the semester following the project.

Procedure

Students

The S.I.C.P. project operated in the Fall 1990 and Winter 1991 semesters. Therefore, all students who had failed or abandoned more than half of their courses in the semester previous to these two terms were invited to apply for acceptance into the S.I.C.P. project.

The procedures followed for the selection of students and the administration of pre and post tests were the same for each semester. Review board students received a letter with their semester grades describing the S.I.C.P. Project (Appendix C). They were telephoned and, if interested in the project, they were requested to come to the college to be interviewed (Appendix D). Criteria for selection included an overall high school average of 70% or above, a current term average of 50% or above, a vocabulary score on the Nelson-Denny Reading Test at or above the 30th percentile, and a comprehension score at or above the 40th percentile. These criteria simply served as guidelines; students who expressed a strong desire to become part of the project were usually admitted despite their academic record.

The Fall 1990 experimental and control groups were administered a series of standardized pretests in August 1990. Posttests were administered in December 1990. The Winter 1991 experimental and control groups were administered the pretests in January 1991 and the posttests in May 1991.

The pedagogical consultant solicited both verbal and written feedback from the students each semester on three separate occasions. In addition, students in both the pilot project (see p 12) and those enrolled during the Fall 1990 semester were interviewed during the semester following completion of the project in order to solicit additional feedback (Appendix E).

Faculty

Each week, the team met for ninety minutes to deal with administrative matters and pedagogical concerns. Examples of strategies used by the team to coordinate efforts are listed in Appendix F.

Analysis of Data

Three general methods of analysis were followed. First, students in the Fall 1990 experimental group, (n=26), and students in the Winter 1991 experimental group, (n=30), were compared on the basis of their term average (for the term prior to entry into the project), and pretest vocabulary and comprehension scores to determine if there were differences between these two groups. No significant differences were found. Therefore, for the purpose of data analysis, the two experimental groups were merged (n=56).

The Fall 1990 control group (n=15) and the Winter 1991 control group (n=24) were compared in a similar manner. Again, no significant differences were found. Therefore, the two control groups were merged (n=39).

Second, to determine if there were differences between the combined experimental and the combined control groups at the beginning of the project, an ANOVA on the pretest results for all measured variables (Nelson Denny Reading Test, Watson-Glaser Critical Thinking Appraisal, LASSI, SSHA, Coopersmith) was performed.

Finally, to measure change over time between the pre- and post tests, and to determine if there were group differences between the experimental and control groups, a repeated measure analysis of variance was carried out for each dependent variable.

More detailed methods of analysis precede each section of the results.

RESULTS

Pretest Results: Experimental Group Versus Control Group

Pretest results indicated a significant difference between the experimental and control groups in vocabulary and comprehension with the control group scoring higher. There was no difference between the experimental and control groups on any other variable.

Students in the control group had an average vocabulary score of 51 which placed them in the 56th percentile and an average comprehension score of 41 which placed them in the 34th percentile. Students in the experimental group had an average vocabulary score of 44 which placed them in the 42nd percentile and an average comprehension score of 36 which placed them in the 25th percentile. The vocabulary (E=.89, p <.03) and comprehension score (F = .78, p <.05) of the students in the control group was significantly higher than the average score of students in the experimental group. If vocabulary and comprehension are accepted as general measures of cognitive complexity or ability (Bormuth, 1966; Coleman, 1971; Davis, 1944; 1968; Thorndike, 1973; Thurstone, 1946), then these results suggest that students in the control group were more capable at pretesting than students in the experimental group.

Pretest/Posttest Results: Experimental Group Versus Control Group

Reading

Nelson-Denny Reading Test results were analyzed for vocabulary and comprehension. Each students's vocabulary and comprehension raw scores were converted into standard scores and percentiles according to the Nelson-Denny norms for students at the beginning of grade 13. Nelson-Denny normalized standard scores have a range of 265 to 333, a mean of 300, and a standard deviation of 15. The average raw score for each group was used to arrive at an average standard score and percentile rank for each group.

The average pretest vocabulary score for students in the experimental group was 44, placing them in the 42nd percentile; their average posttest score was 45, placing them in the 46th percentile. The average pretest vocabulary score for students in the control group was 51, placing

them in the 56th percentile; their average posttest score was 53, placing them in the 60th percentile. A repeated measure ANOVA indicated a significant group by time interaction. Both groups increased their vocabulary scores, with the increase for the control group (2.43) being moderately higher ($p < .04$) than the increase for the experimental group of (2.37).

The average pretest comprehension score for students in the experimental group was 36, placing them in the 25th percentile; their average posttest score was 42, placing them in the 36th percentile. The average prettest comprehension score for students in the control group was 41 placing them in the 34th percentile; their average posttest score was 46 placing them in the 46th percentile. A repeated measure ANOVA indicated that there was no effect for group, but a significant effect for time. Therefore, during the 15 week semester a significant improvement in comprehension was achieved by both the experimental and control groups. Tables 5 and 6 summarize these results.

Table 5 - Vocabulary Results

Group	N	Mean	SD	SScore	%ile
Experimental					
Pre	56	44.07	15.83	302	42
Post	45	46.44	15.24	304	46
Control					
Pre	39	51.36	15.51	307	56
Post	34	52.79	15.62	308	60

Table 6 - Comprehension Results

Group	N	Mean	SD	SScore	%ile
Experimental					
Pre	56	36.09	11.53	295	25
Post	45	42.36	11.87	300	36
Control					
Pre	39	40.86	12.04	299	34
Post	34	46.27	14.03	303	46

Critical Thinking

The Watson-Glaser Critical Thinking Appraisal provided a total score (number correct out of 80) and separate subtest scores (number correct out of 16) for each of five subtests: Inference, Recognition of Assumptions, Deduction, Interpretation, and Evaluation of Arguments. An ANOVA using the five subtests and total score as dependent variables and treatment group as the independent variable was performed to examine differences between the experimental and the control groups at the beginning of the project. No differences were found.

A repeated measure ANOVA performed on the pretest and posttest results for each individual subtest and the total critical thinking score indicated no differences either over time or between groups. Therefore, there is no evidence that there was an improvement in critical thinking skills in either experimental or control group students. Table 7 summarizes these results.

Table 7 - Critical Thinking Scores - Experimental and Control Groups

	Experimental Group		Control Group	
	MEAN	SD	MEAN	SD
Recognition of Assumptions				
Pre	11.49	2.72	10.38	3.51
Post	11.31	2.31	11.25	2.75
Deduction				
Pre	9.41	2.44	9.64	2.37
Post	8.91	2.39	9.56	2.31
Interpretation				
Pre	10.04	2.70	11.08	2.29
Post	10.07	2.12	10.77	2.32
Evaluation of Arguments				
Pre	11.36	2.19	11.77	2.45
Post	10.33	2.69	11.50	1.89
Total Score				
Pre	48.70	9.24	50.49	8.48
Post	48.07	6.83	51.09	6.13

Learning and Study Strategies

The Learning and Study Strategies Inventory (LASSI) was used to assess the students' use of learning and study strategies. This measure has ten scales: Attitude, Motivation, Time Management, Anxiety, Concentration, Information Processing, Selecting Main Ideas, Study Aids, Self Testing and Test Strategies. The average score for each scale was calculated and converted into percentile score equivalents. A repeated measure ANOVA was used to measure changes over time and differences between groups.

In four of the ten scales, *Selecting Main Ideas*, *Study Aids*, *Self Testing*, and *Anxiety*, a two-way (group by time) repeated measure ANOVA yielded a significant effect for time, for group, and a group by time interaction. The difference between the pretest and posttest scores of the experimental group was significant ($p < .001$). In addition, the increases demonstrated by the experimental group were significantly higher in each of these scales ($p < .001$) than the increases demonstrated by the control group.

In three of the ten scales, *Time Management*, *Concentration*, and *Information Processing*, a two-way (group by time) repeated measure ANOVA yielded a main effect for time. Therefore, the increase demonstrated by both the experimental group and the control group was significant over time, ($p < .001$) but the difference between each group was not significant.

In two of the ten scales, *Attitude* and *Test Strategies*, a two-way (group by time) repeated measure ANOVA yielded a significant effect for time and a group by time interaction. Therefore, both the experimental and the control groups significantly increased their scores on these scales, but for each scale the increase for the experimental group was significantly higher when compared to the increase for the control group.

On the *Motivation Scale*, a two-way (group by time) repeated measure ANOVA yielded a group by time interaction. Therefore, the increase shown by the experimental group (2.41) was significant ($p < .05$) whereas the increase within the control group (.59) was not significant. The means, percentiles, and gain scores are summarized in Tables 3 and 9.

Table 8

Pre Versus Post Learning Strategy Scores: Experimental and Control Groups

	Experimental Group		Control Group	
	MEAN	%ile	MEAN	%ile
Attitude				
Pre	30.01	34.4	28.41	21.9
Post	33.00**	60.4	29.53	27.9
Motivation				
Pre	26.68	19.0	25.23	15.0
Post	29.09*	37.9	25.82	15.0
Time Management				
Pre	19.48	31.8	18.28	26.6
Post	23.84***	51.8	20.65***	36.7
Anxiety				
Pre	21.50	23.7	22.18	27.8
Post	26.53**	49.9	21.53	23.7
Concentration				
Pre	22.23	32.7	21.33	27.7
Post	27.22***	62.3	24.27***	44.9
Information Processing				
Pre	25.52	41.1	25.54	41.1
Post	30.09***	74.4	27.74***	53.1
Selecting Main Ideas				
Pre	16.45	29.5	16.85	29.5
Post	20.33***	77.7	17.77	41.6
Study Aids				
Pre	23.13	39.6	22.92	32.9
Post	28.67***	75.8	23.38	39.6
Self Testing				
Pre	22.93	28.3	23.05	34.5
Post	28.31***	72.8	24.09	42.3
Test Strategies				
Pre	26.00	26.2	26.64	26.2
Post	30.71***	51.5	28.24	37.2

($p < .05$)* ($p < .01$)** ($p < .001$)***

Table 9

Learning Strategy Posttest Scores and Gain Scores: Experimental Versus Control Groups

	Posttest Scores		Gain Scores	
Subscale	Experimental	Control	Experimental	Control
Attitude	33.00**	29.53	3.00	1.12
Motivation	29.09*	25.82	2.41	.79
Time Management	23.84	20.65	4.36	2.37
Anxiety	26.53***	21.53	5.03	-.65
Concentration	27.22	24.27	4.99	2.94
Inform. Processing	30.09	27.74	4.55	2.20
Selecting Main Ideas	20.33***	17.77	3.88	.92
Study Aids	28.67***	23.38	5.54	.46
Self Testing	28.31***	24.09	5.38	1.04
Test Strategies	30.71***	28.24	4.71	1.60

Study Habits and Attitudes

In addition to the LASSI, the Survey of Study Habits and Attitudes (SSHA) was used to measure students' study habits and attitudes toward learning. To measure study habits, the Study Habit subtest score was used. This score represents the combination of two other subtests, Delay Avoidance and Work Methods. To measure study attitudes, the Study Attitude subtest score was used. This score also represents the combination of two subtests, Teacher Approval and Education Acceptance. The Study Habit subtest and the Study Attitude subtest each provide a raw score out of 100.

Study Habits

The average pretest Study Habits score for students in the experimental group was 31.73; their average posttest score was 47.80. The average pretest Study Habits score for students in the control group was 31.79; their average posttest score was 35.88. A repeated measure ANOVA indicated a significant effect for time and a strong group difference. Therefore, although each group began the term at the same point and made a significant increase in their scores ($p < .001$), the increase made by the experimental group ($p < .005$) was significantly higher than that experienced by the control group.

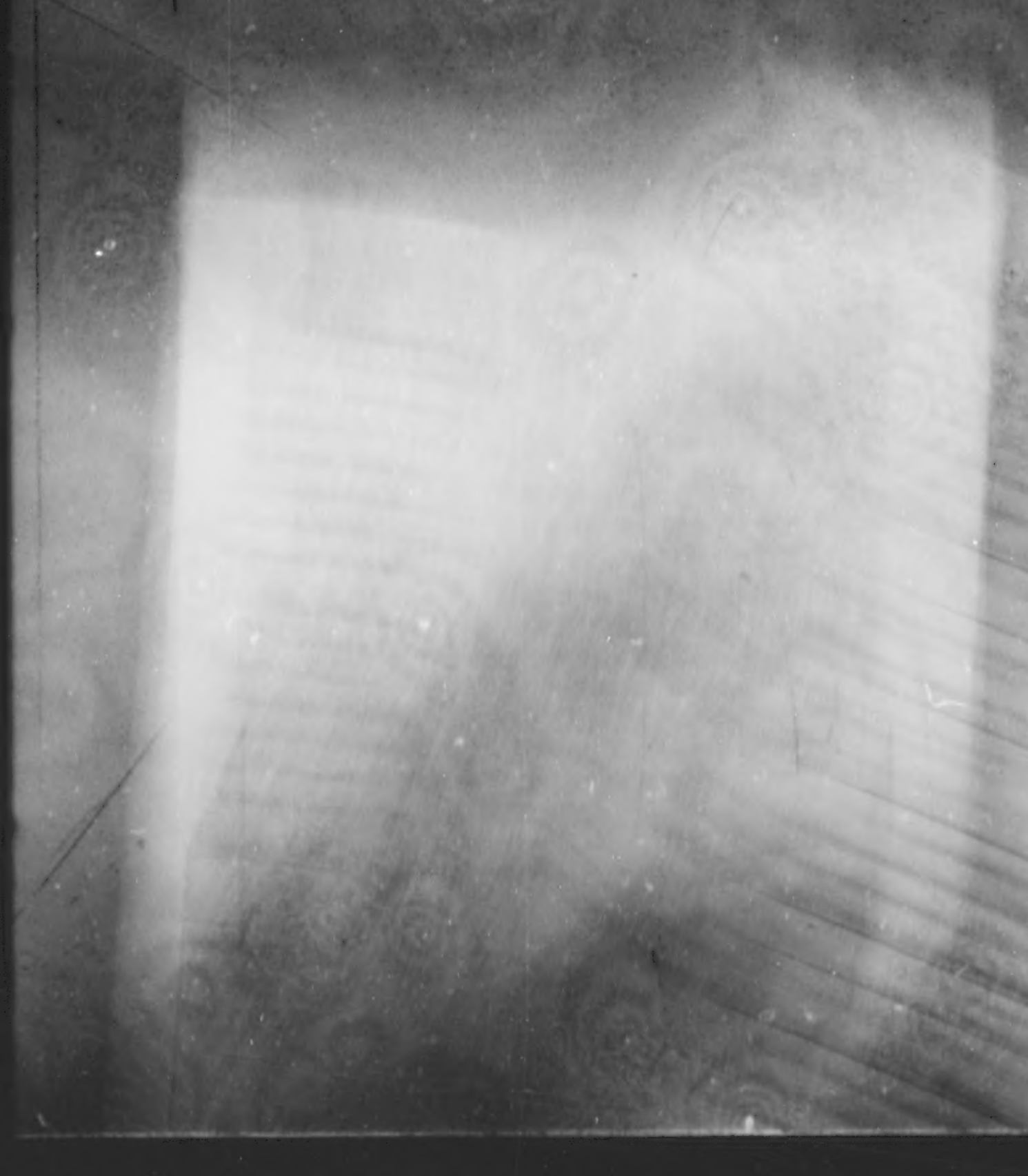
Study Attitudes

The average pretest Study Attitudes score for students in the experimental group was 43.98; their average posttest score was 53.58. The average pretest Study Attitudes score for students in the control group was 41.23; their average posttest score was 47.24. A repeated measure ANOVA indicated a significant effect for time but no group difference. Therefore, each group significantly increased their Attitude score over time ($p < .001$) but there was no significant difference between them. These results are summarized in Table 10.

Table 10 - SSHA Results

	Study Habits		Study Attitudes	
	Mean	SD	Mean	SD
Experimental				
Pre (n=56)	31.73	16.98	43.98	16.94
Post (n=45)	47.80***	21.96	53.58***	20.86
Control				
Pre (n=39)	31.79	15.49	41.23	14.82
Post (n=34)	35.88	18.04	47.24***	17.06

($p < .001$)***



Academic Achievement

Academic achievement was measured by analyzing for both the experimental and control groups, the percentage of courses passed, failed, and abandoned in the term preceding the S.I.C.P. Project, the percentage of courses passed, failed, and abandoned during the S.I.C.P. Project, semester averages for the preceding term, semester averages for the S.I.C.P. term, the percentage of students permitted to return to college after the S.I.C.P. Project, and the percentage of students registered in the term following the project. Tables 11 and 12 summarize these results.

Table 11 - Passes, Fail•, and Abandons before and during the S.I.C.P. Term

	Total Courses Taken	Passes		Fails		Abandons	
	N	N	%	N	%	N	%
Experimental Pre (n=56)	365	132	36%	199	55%	34	9%
Experimental Post	334	159	48%	139	41%	36	11%
Control Pre (n=39)	252	89	35%	105	42%	58	23%
Control Post	236	137	58%	78	33%	21	9%

There was no significant effect of time on term averages for either group, nor was there a difference between the experimental and control group on term averages. Therefore, term averages for each group remained similar.

Table 12 - Pre and Post Term Averages for the Experimental and Control Group

	Experimental		Control	
	MEAN	SD	MEAN	SD
Pre	50.41	11.14	53.11	9.30
Post	52.71	15.93	55.21	20.17

In order to determine the percentage of students permitted to return to college after the S.I.C.P. Project, and also the percentage of students registered in the term following the project, students were categorized into three groups: Persisters, Resisters, and Dropouts. Persisters were

students who successfully completed the term and were allowed to register for the next semester. Resisters were students who completed the term unsuccessfully and were not permitted to return to the college. Dropouts were students who either officially or unofficially withdrew from the college.

A greater number of control group students, 64% compared to 50% for the experimental group, successfully completed the term and were permitted to register for the term following the S.I.C.P. Project. However, at the time of this writing, approximately 50% of the students in each group are registered in the college. There results are summarized in Table 13.

Table 13 - Status in College for the Experimental and Control Groups

	Experimental		Control	
	N	Percent	N	Percent
Persisters	28	50%	25	64%
Resisters	22	39%	11	28%
Dropouts	6	11%	3	8%
	56	100%	39	100%
Currently Registered	28	50%	22	56%

Self-Esteem

The Coopersmith Inventory (Adult Form) was used to measure self-esteem. The raw score (possible score out of 100) was averaged for each group. A two-way (group by time) repeated measure ANOVA yielded no significant effects for time, group, or group by time interactions. The results for each group are summarized in Table 14.

Table 14 - Self-Esteem Scores for Experimental and Control Groups

	Experimental		Control	
	MEAN	SD	MEAN	SD
Pre	69.11	17.67	64.92	18.62
Post	72.44	18.42	66.12	20.52

DISCUSSION

The purpose of the present study was to examine how academic underpreparedness contributes to student failure, and to assess the effectiveness of an interdisciplinary program designed to foster the intellectual abilities and learning skills needed to succeed in college. Failing Social Science students were given a special 15 week program which attempted to simultaneously teach course content and the academic skills required for college success. It was hypothesized that the students who received the treatment, when compared to a control group that did not, would show (a) significant improvement on posttest measures of reading skills, critical thinking skills, learning strategies and attitudes towards learning, (b) a higher overall average during the semester that they were registered in the project, (c) fewer course withdrawals and course failures, (d) a stronger academic persistence profile, that is, a higher probability of returning the following semester and registering for a full course load, and (e) increased self-esteem. This research was motivated by the belief that the intellectual skills and learning strategies needed for success in college could be taught through course content, and that the transfer of these skills would be facilitated when content teachers work collaboratively. Results show that both the experimental and the control groups improved their reading and increased their awareness of how to learn during the 15 week semester. The improvement in knowledge of learning strategies was signficantly higher for the experimental group. Despite the improvement in these two areas, neither group showed significant gains in general academic achievement nor in self-esteem.

The subjects in this study consisted of 95 Social Science students who were candidates for expulsion from the college because of academic failure. Pretest results in reading confirmed that these students were seriously underprepared to perform college reading tasks. In a previous study carried out at Champlain College, (Bateman, 1990) the average vocabulary percentile for incoming Social Science students was 63, while the average comprehension percentile was 50. The students in the present study were in attendance at the college for at least one year at the time of the pretest. The 56 students in the experimental group had an average vocabulary percentile of 42, and an

average comprehension percentile of 25. The 39 students in the control group were also below the average found in the Bateman study. They had an average vocabulary percentile of 56, and an average comprehension percentile of 34. It appears then that the weak vocabulary and comprehension skills exhibited by these review board students contributed to their failure in school. These findings support current research that suggests that academic underpreparedness leads to failure (Noël, Levitz, & Saluri, 1985; Roueche, Baker, & Roueche, 1984; Weinstein, Goetz, & Alexander, 1988).

Despite the low reading scores of the students in the control group, pretest results indicated that the control group had vocabulary and comprehension skills that were significantly higher than students in the experimental group. This suggests that students in the control group were more capable and better prepared for college than students in the experimental group. This difference may also be attributed to the selection process. Teachers selected students whom they felt were in the most need of assistance. During the interviewing process, many of the students who eventually went into the control group had expressed a desire to attempt college once more on their own. They were concerned about the stigma attached to being in a special project, and frequently blamed a lack of personal organization or unfair teachers as the reason for their failure. They felt that they knew how to succeed in college and just needed a second chance. There is also evidence of a greater level of self-awareness in the control group students. In the term prior to the S.I.C.P. project, students in the control group had abandoned 23% of their courses. This contrasts with the 9% of abandoned courses for students in the experimental group. It appears that the students in the control group were more realistic and aware of what they could accomplish, and at least attempted to avoid disaster. The lack of foresight displayed by the students in the experimental group continued throughout the S.I.C.P. project. Many who subsequently failed the S.I.C.P. term expressed surprise despite the fact that their tenuous academic standing had been frequently brought to their attention throughout the semester. Therefore, at the beginning of each term the students in the control group appeared to be more capable and somewhat more aware of themselves as learners.

The results on the Nelson-Denny Reading Test show that both the experimental and control group students had difficulty selecting relevant information, noting the relationship between ideas, making inferences, and drawing conclusions. However, both groups made significant improvement in comprehension during the semester, confirming previous research which suggests that comprehension can be taught and does improve during CEGEP (Bateman, 1990). Despite the significant improvement of both groups, their average scores at posttesting were still below the average score of incoming Social Science students. These results demonstrate the need for the continued development of these skills at the CEGEP level.

The basic premise underlying the S.I.C.P. project was that learning strategies can be taught through course content. The results on the LASSI and the SSHA support this belief. The experimental group demonstrated a greater awareness than the control group on the Selecting Main Ideas, Study Aids, Self Testing, and Anxiety scales. The development of the ability to select main ideas was focused on in several S.I.C.P. courses. Students received practise in the development of this skill through textbook readings, notetaking instruction, outlining instruction, essay writing, listening to audio-visual materials, and classroom lectures. Students also received direct instruction in the use of study aids. They were encouraged to use the study aids already in their textbooks, such as special headings, summaries and statements of objectives, as well as to create their own aids such as concept maps, summary sheets and underlining. Self testing techniques were stressed in the Psychology of Learning course and reinforced in all other courses. These techniques encourage a systematic review of what has been learned and show students how to prepare for tests. They also encourage the consolidation of new knowledge into what the learner already knows. This approach facilitates comprehension and discourages rote memory. The improved ability to select main ideas and use study aids and self testing techniques may have reduced the anxiety of students in the experimental group regarding their own ability, intelligence, or likelihood of success. Their score on the Anxiety scale indicated that they were better able to attend to the learning task as opposed to focusing on their own anxieties.

The experimental group also showed significant improvement on the Test Strategies,

Attitude, and Motivation scales. The reduction in the experimental group's level of anxiety might have been influenced by their increased awareness on how to prepare for and take tests as reflected on the Test Strategies scale. In addition, their significant improvement on the Attitude scale over time and in contrast to the control group indicates that the experimental students became more goal oriented regarding their education, developed a more positive attitude toward college, and a greater sense of control over their academic lives. Their improvement on the Motivation scale indicates an increased awareness that success in college requires keeping up with assignments and coming to class prepared.

Both the experimental group and the control group improved significantly on the Time Management, Concentration, and Information Processing scales. These results suggest that during the 15 week semester, students in both groups became more aware of how to manage their time, how to focus on their school work, and how to think, reason, and organize knowledge in a meaningful way. The results on the LASSI were further supported by the experimental group's significant increase in study habits as measured on the SSHA.

The results on the Nelson-Denny Reading Test, the LASSI, and the SSHA support current thinking in cognitive psychology that inadequately prepared students can be shown how to become independent learners, and can learn the competencies that successful students use (Bransford, Sherwood, Vye, & Rieser, 1986; Brown, Campione, & Day, 1981; Brown & Day, 1983; Haller, Child & Walberg, 1988; Palinscar & Brown, 1984; Weinstein, 1988). It seems, then, that many students have not yet developed the unique reading skills and learning strategies required for learning in college and that college is an appropriate place to develop them.

The experimental group's increased awareness about the use of learning strategies was not reflected in their general academic achievement; neither the experimental nor the control group demonstrated a significant improvement in course grades or overall term averages. Gadzella and Williamson (1984) attest to the strong relationship that exists between good study habits and academic achievement. However, research conducted at Champlain College (Kerwin-Boudreau,

1985) did not find a positive relationship between the two. The improvements noted in the LASSI and SSHA might reflect more of a knowledge of which study skills they should be using, as opposed to which skills they are implementing in all of their courses. In fact, it might be that while students are in the process of acquiring new learning strategies, educators cannot expect the impact of these strategies on their academic achievement and self-esteem to be immediately apparent. Similarly, students may need time to practise the newly acquired skills in order to integrate them into their daily study routines. To determine if the increased awareness of how to learn transfers into permanent study habits that affect academic achievement a follow-up study of the students who participated in the S.I.C.P. research is necessary.

The contrast between the academic achievement of the experimental and control groups is not striking. In both groups, approximately 50% of the population continued their studies. However, interviews conducted with successful graduates of the S.I.C.P. capture the emotional and psychological development that is not measured through standardized tests. For example, many students reported that the project fostered their own process of maturing:

"I would have gotten here anyway, but the project helped me get here faster."

Others reported that the project allowed them to do well and experience success:

"Through the project I got good marks and now I want to maintain these, I want more and more now."

"S.I.C.P. allowed me to do well. This encouraged me to come back and get an education."

The project also helped them to become more goal oriented.

"The project made me wake up. I was throwing my life away. Now I know where I'm going."

Most importantly, it provided them with a model of how to be an effective college student.

"What I learned from S.I.C.P. is that this is the way I'm supposed to be in CEGEP. This is the way I should be all the time."

In conclusion, this research confirms that many students at CEGEP are not adequately prepared to perform college level learning tasks. They lack the necessary intellectual skills and learning strategies required for success in college. This research has also demonstrated that these skills can be taught and that the CEGEP is an appropriate place to develop them. These findings raise many issues for those involved with the CEGEP system. CEGEPs were created to provide a route to postsecondary studies for students who would otherwise not have access. In principle, all secondary school graduates have access to a college education, but whether or not all students gain equally from the college experience can be questioned. Well prepared students could be expected to make good use of their college experience. It is the challenge of the CEGEP system to provide the less prepared student with a curriculum and an environment designed to maximize their chances for success.

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APPENDIX A

Criteria for Effective Reading

The following criteria are based on the belief that reading comprehension is an interactive process, a process of bringing meaning to a text, and is influenced by processing speed, prior knowledge of the subject matter, metacognitive processes, and learning strategies. It is recognized that college reading tasks require two types of reading: reading for meaning and reading for remembering. In order to establish criteria for effective reading, the process of reading for meaning and remembering has been broken down into three levels of comprehension: literal comprehension, inferential comprehension and analytical comprehension.

Level 1

Literal comprehension requires that the reader identify and describe the information that is contained in the text. A student who has mastered Level 1 should:

1. Understand word meanings.
2. Recognize that comprehension is influenced by previous experience and knowledge of the subject .
3. Identify simple and complex thought relationships when they are made explicit by the author.
    a. Identify the topic
    b. Identify the main point or central idea
    c. Identify the major issue of each section
    d. Identify the examples or details that support the main point
    e. Identify explicit assumptions
    f. Identify connections between elements (correlation & association)
    g. Identify cause/effect relationships
    h. Identify contrast relationships
    i. Identify fact and opinion
    j. Identify chronological sequence
    k. Classify information
4. Can remember the information
5. Shows awareness of specific strengths and weaknesses in own reading performance (abilities listed above) and, in addition, (a) understands the explicit and implicit demands of the reading task, (b) engages in self-questioning to determining whether comprehension is occurring, and (c) takes corrective action when comprehension fails.

A continued

Level 2

Inferential comprehension requires that the reader make reasonable inferences which go beyond the actual information contained in the text. A student who has mastered Level 2 should be able to:

6. Compare previous experience and knowledge to information in a given reading.
7. Infer simple and complex thought relationships when they are not made explicit by the author.
    a. Infer the main point or central idea
    b. Infer the author's purpose
    c. Infer the author's assumptions
    d. Infer and illustrate the main elements of a reading
    e. Infer different perspectives presented in a reading.
8. Summarize the author's ideas in own words
9. Show awareness of own learning processes in inferential reading situation.

Level 3

Analytical comprehension requires that the reader break down the material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved.

10. Set previous experience and knowledge within the context of a given reading
11. Analyze simple and complex thought relationships in a reading selection.
    a. Analyze a main point
    b. Analyze the organizational structure of a reading selection
    c. Analyze deductive and inductive reasoning processes
    d. Analyze assumptions about ideas and audience
    e. Analyze implication of ideas
    f. Analyze the relationships of perspectives presented in a reading
12. Show awareness of own learning process in an analytic reading situation.

Dianne Bateman
Success-In-College Project

Elaboration of Project Objectives into Course Content

Courses	Project Objectives			
	1 Communication	2 Responsible Learners	3 Valuing Education: Mind, Body, Spirit	4 Analytical Thinking
English	writing through essay writing using three expository methods (example, comparison contrast, cause & effect) study of syntax	weekly homework assignments, regular quizzes, encouraged active questioning in class	through modeling by teacher	analysis of model essays; study of English syntax
Physical Educators	listening skills, small group interaction skills	3 term projects (nutritional survey, weight training, individual cardiovascular training)	knowledge of body functioning and its reaction to abuse; discussion of concept of "wellness"	analysis of results of term projects and of individual progress in physical fitness
Political Science	reading (previewing, locating main ideas); writing (knowledge of and use of excerpts); oral communication	6 week research project; how to use the library	valuing of the social sciences and the scientific method	teaching & application of scientific method and the research cycle

Elaboration of Project Objectives into Course Content (Cont'd)

Courses	1 Communication	2 Responsible Learners	3 Valuing Education: Mind, Body, Spirit	4 Analytical Thinking
Psychology Seminar	active listening small group interaction skills	development of goal-setting, self-assessment, locus of control and self-esteem	emphasis on affective education, discussion of values, career direction, spiritual wholeness	analysis of choices and of resulting feelings and actions
Sociology	oral communication (through class discussions) listening to peers, teacher, audio-visual materials	regular homework assignments, small group collaborative work	importance of education, particularly for women to break poverty cycle	use of concepts to analyze concrete social situations
Psychology of Learning	reading (previewing, locating main ideas), listening (in lectures, to audio-visual presentations, to peers), note making and note taking, oral communication	regular assignments and tests, emphasis on time management	on-going discussion and exercises re. value of learning	analysis of content of articles, textbook chapters
Humanities	writing: 3 essay drafts and final essays oral communication: 1 oral presentation, class discussions	weekly assignments on assigned readings notebook collected on a regular basis essays assigned early in the semester	class discussions on values intrinsic in political choices in current events, e.g. the Gulf war, discussion on values inherent in Marxism, Social Darwinism and modern generic research, role of religion in society	emphasis on cause and effect

APPENDIX C

Notice Regarding S.I.C.P. Sent to Review Board Students

The Success-In-College Project is a special program that has been devised especially for Social Science review board students. This one semester program is designed to provide students with the necessary learning strategies, basic skills and background knowledge that should subsequently allow them to function independently and successfully as Social Science students.

One of the criteria that the Review Board will look favourably upon is whether or not Social Science students seeking readmission to the college have applied for and have accepted into the Success-In-College Project.

Potential candidates will be interviewed by a number of faculty members. Acceptance into the program depends on two criteria being met:

1. faculty members must believe that the student can be helped though the project,

2. the student must indicate a strong desire to be part of the project.

For the winter 1991 semester, a group of 30 successful candidates will register in the same 6 courses:

English	Aileen Ouvrard
Psychology of Learning	Susan Kerwin-Boudreau
Sociology	Ellie Malus
Political Science	Yvon Geoffroy
Physical Education	Stuart Robertson
Humanities	Catherine Gillbert
Psychology Seminar	Catherine Plaw (non-credit-attendance mandatory)

Throughout the semester students remain together in these 6 courses and the teachers work closely together to make the Success-In-College Project dynamic, interesting and helpful. Individual students may also choose to register independently for a seventh complementary course of their choice.

If you qualify for an interview as a possible candidate you will receive a phone call from us on Monday, January 7th or Tuesday, January 8th, 1991.

APPENDIX D

Interview Questions for S.I.C.P. Candidates

DATE **TIME**

Name of Student_____

Number of semesters completed:_____

Interviewed by_____

Data on last semester:_____

(Has student read letter explaining the SICP. Any questions?)

1. Why did you fail last semester?
2. What are your reasons for coming to CEGEP?
3. Could you describe your study environment?
4. What are you good at in school?

   What do you need help with?
5. Have you ever done something you were particularly proud of? Tell us about it.
6. What are some of your immediate goals?

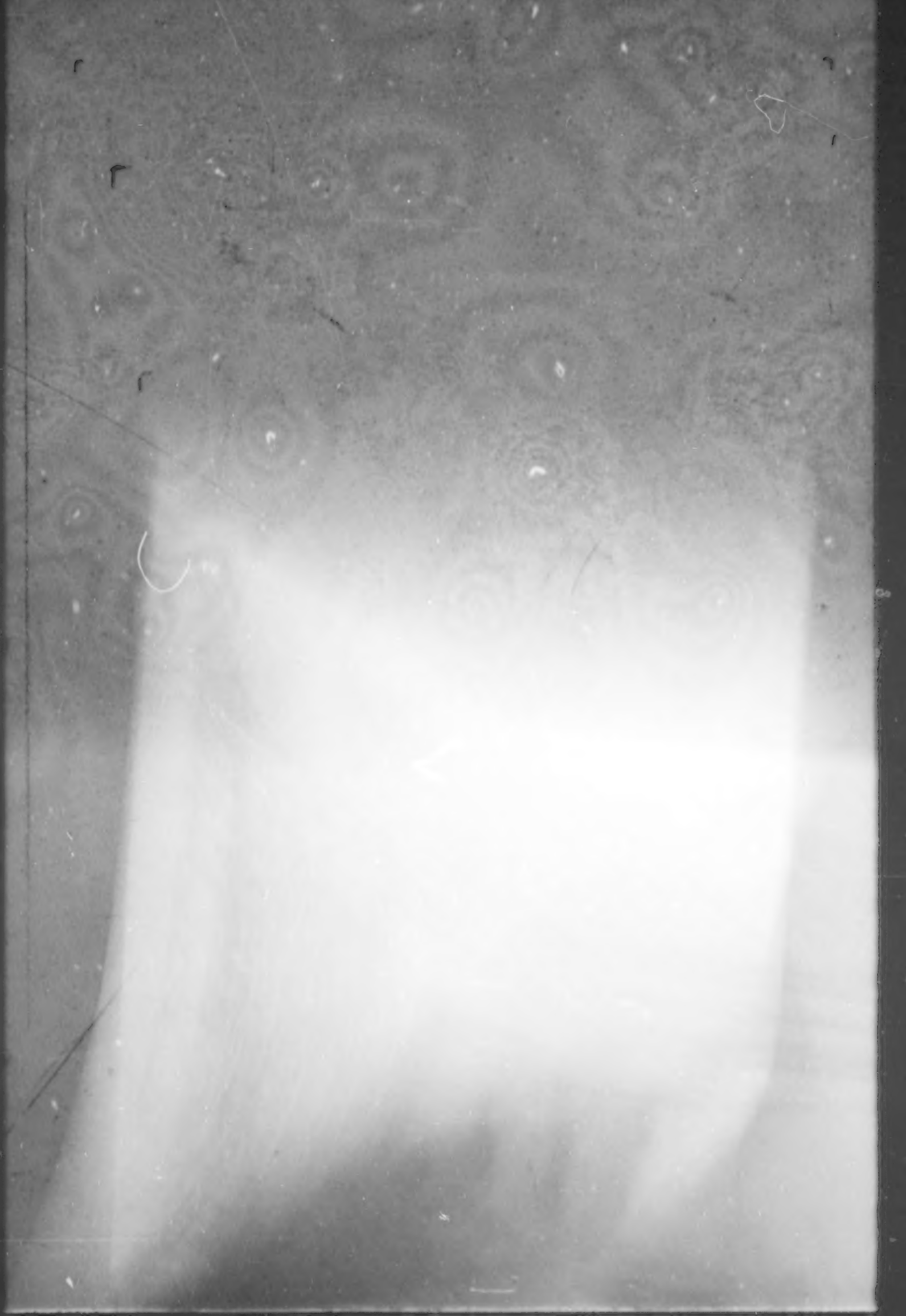
   What are some of your long-term goals?

   Do you feel committed to these?
7. Will you work part-time this semester?

   Where?

   How many hours per week?

   Are you willing to limit your working hours to no more than 12-15 hours per week this semester in order to be part of this project?
8. What extra-curricular activities do you enjoy?



D continued

9. If given the option to enter the Success-In-College Project or if the college decides to readmit you through the regular stream, what would you choose? Why?

10. Give student copy of Operating Rules for the SICP.

    Explain to student that he still should write a letter to the Dean requesting readmission and mentioning that he was interviewed by us.

Comments:

Data:

H.S. average_____current sem. average_____BCU aver._____

Nelson Denny comprehension _____percentile
vocabulary _____percentile

	Not Acceptable	V.Poor	Marginally Acceptable	V.good	Excellent
Rating of Candidate	1	2	3	4	5

Accepted _____
Rejected _____

APPENDIX E

Follow up Interview questions for Graduates

I'd like you to act as a consultant for the SICP as you think about your experience last semester and give us feedback on how you think the project should be designed.

1. How are you doing this semester?

2. What's different this semester from the semester you failed?

3. Was there anything you liked about the SICP?

4. Was there anything you didn't like?

5. What specific parts of the SICP helped you the most?

6. What specific parts helped you the least?

7. This semester, have you been able to use any of the learning strategies you used last semester?

   Which ones?

   In which courses?

8. Have your goals changed since you first found out you were a review board student?

   What caused the change to occur?

   What are some of your goals today?

E continued

9. Have your attitudes changed towards

   1. learning (what education means to you)

   2. how you view yourself as a student?

   3. how you view your teachers and their role in the educational process?

   Do you intend to continue your education?

   Why?

10. Looking back at the SICP, how many courses do you think it would take to make this project work (with teachers working together, students in same courses)?

    Which courses?

11. How did you feel about being with the same students for the entire semester?

    Was it a positive experience?

    Was there a negative side to it?

12. How do you think you would have done as well last term without the project?

13. If you could give advice on how best to succeed in college course work, what kind of advice would you give to fellow students?

14. Talk about what you believe is the key to doing well in college courses.

APPENDIX F

Strategies for Team Coordination

1. Each teacher identified and focused on the abilities and skills, outlined in the four agreed upon objectives, that were most applicable to their discipline.

2 At the beginning of each semester, individual course objectives (which emphasized the common project objectives) were discussed and made available to all members of the team.

3. Each teacher kept a weekly journal which was submitted to a pedagogical consultant in which they answered the following questions:

   (a) What content did you cover this week?

   (b) What learning outcomes or abilities will students develop as they master this content? (program goals/intellectual skills)

   (c) What learning strategies are required in order for students to master the content and the learning outcomes?

   (d) What methods and tools did you use to teach these strategies?

   Each teachers was also asked to answer questions periodically on assessment of student learning:

   (e) How are you assessing student learning in terms of content?

   (f) How are you assessing student learning in terms of abilities or learning outcomes?

4. The team began to define the criteria for some of the abilities. Criteria were developed for:

   (a) effective reading skills (Appendix A)

   (b) oral communication skills (Appendix G)

   (3) listening skills for audio-visual materials (Appendix H)

5. During the Fall 1990 semester, a weekly grid, outlining the content and process objectives for each course was distributed and discussed at the team meeting. In this way, all teachers were provided with an overview of what students in the project would be learning and were able to discuss ways to coordinate the teaching of the abilities (Appendix I).

6. On November 8, 1990 the team took part in a workshop which focused on the principles of learning, criteria for effective reading, listening and oral communication, and the weekly pedagogical journals.

7. During the Fall 1990 semester, each teacher served as a consultant for a small group of students who were preparing their final research project in the Political Science course.

8. At the beginning of the Winter 1991 semester, all team members organized a study strategies workshop for the students during which the application of study strategies across the curriculum was discussed.

9. During the Winter 1991 semester, the English teacher began working with the content area teachers to promote writing in each course.

10. The team developed a common attendance policy: any student who missed more than six hours of any class for reasons other than illness did not receive a passing grade for the course.

11. Common criteria for selecting students into the project were developed. All teachers participated in the interviewing of applicants.

12. During the Winter 1991 semester, each term member served as a mentor for a few students in the project. The purpose of the mentoring system was to provide each student with a number of informal meetings throughout the semester in order to increase the student's sense of feeling connected to the college.

13. The team produced an Academic Council newsletter in which the S.I.C.P. was described to the Champlain College community.

14. At the end of the Winter 1991 semester, the team met with the college administration in order to ensure that the S.I.C.P. would continue as a regular option in the college curriculum.

15. At the end of the Winter 1991 semester, the team met to evaluate the strengths and weaknesses of the S.I.C.P. and established a number of recommendations for the future. (Appendix J)

APPENDIX G

Criteria for Oral Communication Skills

TO:
FROM:
DATE:
TOPIC:

A = Excellent
B = Very Good
C = Poor (it needs improvement)
D = Very Poor

1. Reaching audience through DELIVERY

   A. PACE
   B. PITCH
   C. PROJECTION
   D. ENUNCIATION
   E. FLUENCY

2. Reaching audience through FORMAT

   A. INTRODUCTION (including purpose)
   B. BODY
   C. CONCLUSION

3. Reaching audience through appropriate CONTENT

4. Reaching audience through STYLE

   1. PERSONABLE
   2. SPEAKING ON ONE'S FEET (including eye contact & body language)
   3. USE OF TRANSITIONS

5. Use of Visuals

6. Time

OVERALL INSTRUCTOR ASSESSMENT

SELF-ASSESSMENT

/lc
FEEDBACK.SHEET; Developed by Susan Kerwin-Boudreau, 1991.

APPENDIX H

Criteria for Listening Skills

To get the most out of audio-visual material you must

a. pay close attention throughout

and

b. concentrate by listening actively and thinking deeply. The following criteria will help you to do so.

1. Focus on preview information.
2. Pay close attention to title and turn it into a question.
3. Determine purpose of video. Determine your role.
4. Pay attention by sitting in front, imagining "one on one".
5. Concentrate. There is a real difference between merely hearing words and actively listening to process ideas.
6. Realize that you can think much faster than the speaker can speak. Use this time differential to listen actively and to think deeply by
   a. rehearsing and embedding ideas being discussed
   b. anticipating upcoming ideas
   c. forming bridges among lecture notes, readings, and A.V. material.
7. Actively search for main ideas and overall organization of A.V. material and pay close attention throughout.
   - at beginning - main ideas/organization/purpose often introduced
   - main ideas developed throughout
   - conclusion - main ideas often reiterated or summarized

H continued

8. Record main ideas through notes or a map. Be flexible. Identify organizational pattern used by speaker and record information accordingly.

9. Discuss contents and ask questions after viewing A.V. presentation. This will consolidate information.

Developed by Susan Kerwin-Boudreau.
Source: Pauk, W. (1989). How to Study in College
Boston: Houghton Mifflin Co., chapter 6, p. 121-132

APPENDIX I

Sample Grid of Weekly Content in all S.I.C.P. Courses

COURSE CONTENT FOR WEEK OF SEPTEMBER 17, 1990

Psychology of Learning Skills: New Skills: 1. monitoring your comprehension, 2. locating main ideas and supporting details, (Time Management) 3. how to build a weekly schedule Students continue with daily "to do lists", recording total study time, self-assessment of their studying & RAM notes (ch. 1 & 2) Content: ch. 1 (Ellis) ch. 2 (Time Management, including "Be Here Now"	**English** 1. Structure of expository paragraph 2. Ms. format 3. Parts of speech, cont'd. 4. Close observation project cont'd.
Psychology Seminar Continue with work on the valuing process. Link goal setting with values. Summary of the group's values. Introduction of stress management, creativity and visualization.	**Humanities** We will be looking at the contributors of Ancient Athens to western civilization with an emphasis on Plato. I am showing the film on the Apology. We are continuing to discuss the Middle East crisis. This week I plan to briefly cover the history of the State of Israel. A writing assignment is due next week.
Political Science Skills: Library research, research cycle, scientific method, concepts & referents, rules of classification, applying concepts Reading for week: "Social Science & the Scientific Method"	**Sociology** Continuation of culture: norms, folkways, laws, sanctions. In-class activities.
Physical Education Calculation of calories in versus calories out General discussion of fad diets (analytical thinking) Resting pulse rate/target heart rate 15 min. run at target heart rate 5-station muscular endurance circuit Flexibility-(development of own repertoire of exercises) Check of 5 week planning diary Game - small group dynamics 1st aid B - breathing Heimlich Manoeuvre	

APPENDIX J

Recommendations for the Future

1. That the API's will be responsible for selecting the students for the project and will consider the students' admission profile, with a high school average of 65% as the minimum and a certain degree of maturity and good sense.

2. That we schedule a meeting during the first week of classes with the API's - to get a profile on the students they have selected. This information meeting will include students' BCUs, reading scores and background information that seems important.

3. That we encourage students to register in a full course load, either 5 SICP courses + 2 regular courses or 6 SICP courses + 1 regular course depending how many SICP courses we offer.

4. That progress report cards on each student be issued at the end of weeks 5 and 10, including feedback re. tests, assignments completed, absences in each class and prognosis re. the likelihood of passing or failing the course.

5. That one of the SICP teachers includes the above step in the course objectives.

6. That Catherine Plaw (and, perhaps, Dianne Bateman) will consider the advisability of administering the WAIS test to discover learning disabilities in particular instances.

7. That in week 4 we schedule individual meetings with students to be held in week 5.

8. That we refrain from unnecessarily negative comments about students.

9. That we give ourselves a good dinner out during the mid-semester slump (week 6).

10. That our pedagogical consultant (Dianne Bateman) go into class to solicit feedback for the teachers from the students in weeks 4 and 8.

J continued

11. That we stress to the students at the beginning of semester that the SICP courses are college-level courses.

12. That all SICP teachers use 5% of their final marks for participation in the weekly psychology seminar.

13. That teachers who take part in the SICP are expected to assess student learning frequently, beginning in week 1.

14. That we have a session next semester on assessing teaching and learning.

15. That the SICP be offered next year during the winter 1992 semester in order to focus primarily on first semester students who have failed.

Code de diffusion 1532-0329